

## Sodium, Potassium and Hypertension

### Key Messages

- ※ An adult is said to have hypertension if systolic blood pressure is persistently higher than or equal to 140 millimetres of mercury (mmHg) and/or diastolic blood pressure is persistently higher than or equal to 90 mmHg. In Hong Kong, the Population Health Survey 2014/15 observed that 27.7% of persons aged 15–84 had hypertension.
- ※ Studies show that the higher the sodium intake, the higher the risk of hypertension. For healthy adults, the World Health Organization (WHO) recommends a daily sodium intake of less than 2 grams (or less than 5 grams of salt). However, persons aged 15–84 in Hong Kong consume too much sodium with an average daily salt intake of 8.8 grams.
- ※ Studies find that increased potassium intake lowers blood pressure in people with hypertension. For beneficial effects on blood pressure, WHO recommends apparently healthy adults to consume at least 3.5 grams of potassium a day. However, persons aged 15–84 in Hong Kong consume too little potassium with an average daily potassium intake of 2.3 grams.
- ※ Dietary strategies for the prevention of hypertension include reducing sodium intake and increasing potassium intake, among others (such as limiting intake of saturated fat and trans fat for vascular health). Besides, members of the public should also avoid smoking, refrain from alcohol drinking, be physically active as well as maintain an optimal body weight and waist circumference.

# Sodium, Potassium and Hypertension

Hypertension (or high blood pressure) is one of the most common chronic diseases. For an adult, if systolic blood pressure is persistently higher than or equal to 140 millimetres of mercury (mmHg) and/or diastolic blood pressure is persistently higher than or equal to 90 mmHg, the person is said to have hypertension<sup>1</sup>. If left untreated, persistently high blood pressure can lead to stroke, heart diseases and kidney failure.

Globally, the number of people aged 30–79 with hypertension doubled from 331 million women and 317 million men in 1990 to 626 million women and 652 million men in 2019<sup>2</sup>. In Hong Kong, the Population Health Survey 2014/15 observed that 27.7% of persons aged 15–84 (30.1% for males; 25.5% for females) had hypertension and the prevalence steadily increased with age from 4.5% among those aged 15–24 to 64.8% among those aged 65–84<sup>3</sup>. A number of non-modifiable risk factors (such as increasing age and a family history of hypertension) and lifestyle-related risk factors (including unhealthy diet, physical inactivity, smoking, alcohol consumption, and being overweight or obese) predispose a person to develop hypertension<sup>1</sup>. This article addresses one aspect of diet: the impact of sodium (or salt) and potassium intakes on blood pressure and risk of hypertension.

## Excessive Sodium Intake and Hypertension

Studies show that the higher the sodium intake, the higher the risk of hypertension<sup>4</sup>. One of the underlying mechanisms could be related to the inability of kidneys to fully excrete excess sodium and regulate the volume of body fluids<sup>5</sup>. Excess sodium in the body would cause fluid retention, increase vascular resistance and elevate the pressure in the blood vessels. Over time, it can lead to hypertension<sup>5, 6</sup>. For healthy adults, the World Health Organization (WHO) recommends a daily sodium intake of less than 2 grams (or less than 5 grams of salt)<sup>7</sup>. For children, the recommendation is even less: 0.8 grams of sodium (or 2 grams of salt) a day<sup>7, 8</sup>. However, most individuals across the globe consume almost double the recommended maximum daily intake<sup>9</sup>. While sodium occurs naturally in a variety of foods, it is often found in high amounts in processed foods (such as processed meat, breads, crackers and snack foods) as well as condiments and sauces (such as soy and fish sauces)<sup>7</sup>. In some countries, up to 75–80% of sodium consumed by people every day comes from processed foods<sup>8</sup>.

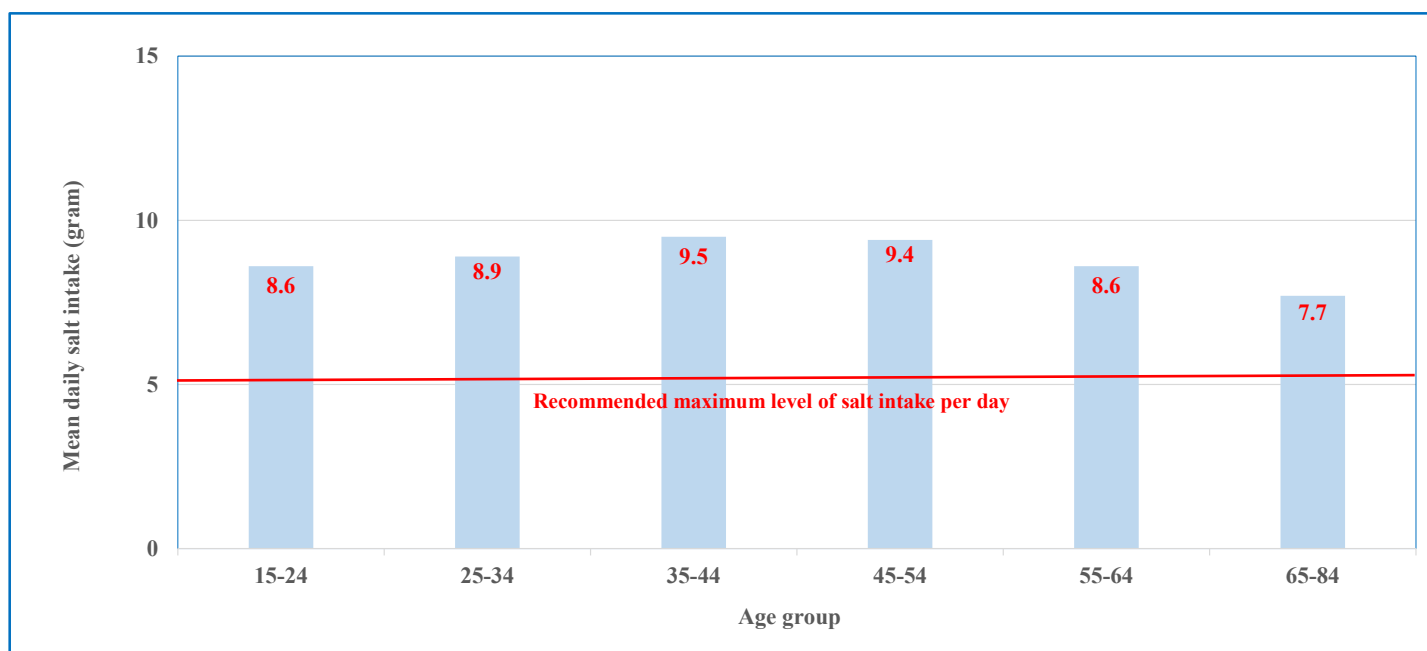
## Potassium Intake and Blood Pressure Lowering

Contrary to the positive association between consuming too much sodium and elevated risk of hypertension, studies find that increased potassium intake lowers blood pressure in people with hypertension<sup>10</sup>. Potential mechanisms include that potassium favours urinary sodium excretion, and it in turn reduces the volume of body fluids and aids in regulating blood pressure. In addition, potassium relaxes the walls of the blood vessels and therefore reduces the risk of hypertension<sup>6, 11</sup>. For beneficial effects on blood pressure, WHO recommends apparently healthy adults to consume at least 3.5 grams of potassium a day. The recommended potassium intake for children should be adjusted downward based on their energy requirement<sup>12</sup>. While potassium is commonly found in fruits and vegetables, most populations around the world consume less than the recommended levels of potassium<sup>12, 13</sup>.

## Salt and Potassium Intake among Hong Kong Population

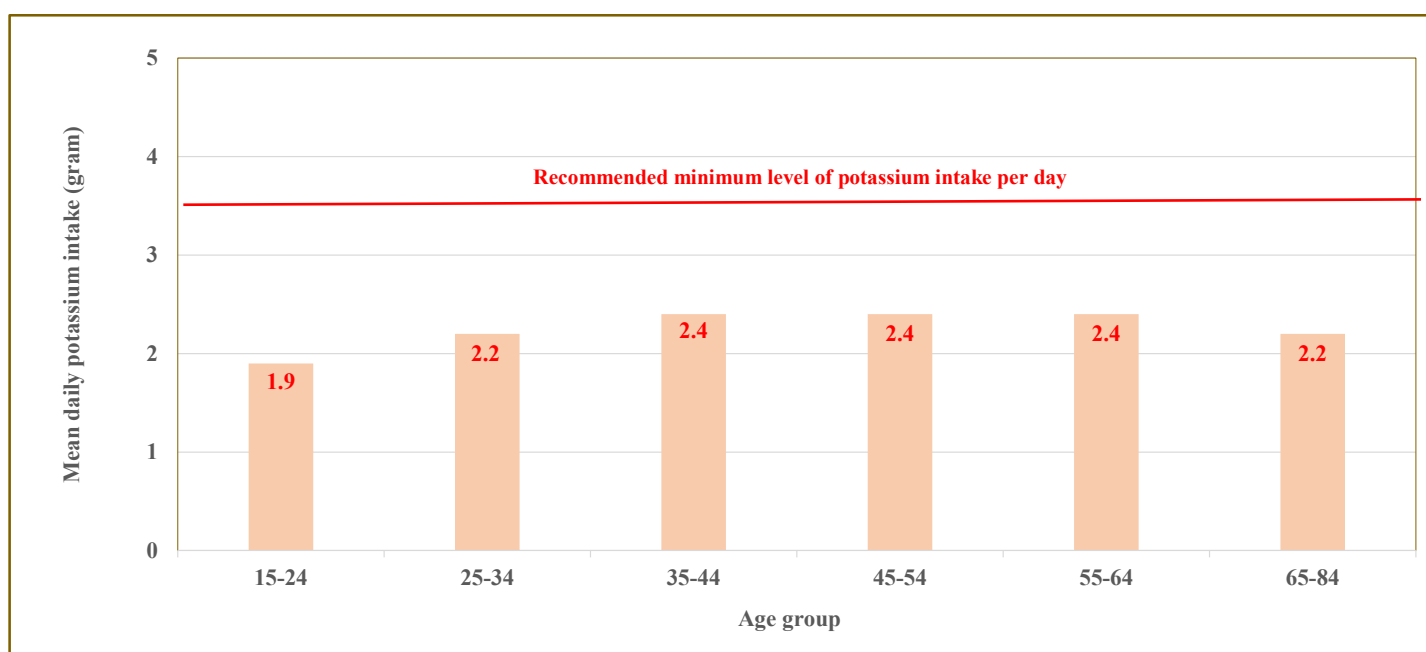
People in Hong Kong consume too much salt but too little potassium as well. The Population Health Survey 2014/15 of the Department of Health<sup>3</sup>, which assessed dietary salt and potassium intakes by measuring sodium and potassium excretion from 24-hour urine collection, estimated that the average daily salt and potassium intakes among persons aged 15–84 were 8.8 grams (9.8 grams for males; 7.9 grams for females) and 2.3 grams (2.3 grams for males; 2.2 grams for females) respectively. As shown in Figure 1 and Figure 2, all age groups failed to meet the benchmarks set by WHO. While the mean daily salt intake was highest among persons aged 35–54 (more than 9 grams), the mean daily potassium intake was lowest among persons aged 15–24 (1.9 grams). Overall, 86.3% of persons aged 15–84 had salt intake above the WHO recommended maximum level of 5 grams per day; 91.5% of them had potassium intake below the WHO recommended minimum level of 3.5 grams per day<sup>3</sup>.

**Figure 1: Mean daily salt intake among persons aged 15–84 by age group**



Source: Population Health Survey 2014/15.

**Figure 2: Mean daily potassium intake among persons aged 15–84 by age group**



Source: Population Health Survey 2014/15.

## Dietary Approach to Prevent Hypertension

Dietary strategies for the prevention of hypertension include reducing sodium intake and increasing potassium intake, among others (such as limiting intake of saturated fat and trans fat for vascular health).

To reduce sodium intake, members of the public are encouraged to<sup>14</sup>:

- use fresh foods where possible when making home-made meals;
- limit consumption of high sodium or salt-preserved foods, such as processed meat, instant noodles with soup base, canned soup, salted eggs, or pickled vegetables;
- reduce the use of salt or other salt-containing sauces (e.g. soy sauce or oyster sauce). Natural ingredients, herbs and spices, such as garlic, pepper, lemon juice, vinegar, basil, oregano, five-spice powder and paprika could be used to enhance the flavour of dishes;
- make sauces with fresh ingredients, such as lemon, tomato, bell pepper, pumpkin, spinach and avoid ready-to-use sauces;
- avoid adding salt or salt-containing condiments at the table;
- avoid pickled or canned vegetables. If they are used, rinsing and soaking them in water before cooking could reduce the sodium content;
- replace crisps, savory crackers or other salty snacks with low-salt alternatives, such as fresh fruits, dry-roasted and plain nuts;
- choose foods prepared with natural seasonings and less sauce, and request to serve the sauce separately when eating out; and
- read nutrition labels for the sodium content and select the one with less sodium.

In general, the recommended intake of potassium could be achieved by a healthy dietary pattern<sup>15</sup>. Members of the public are encouraged to eat according to the “Healthy Eating Food Pyramid” (Box 1) with at least 5 servings of fruits and vegetables a day. Food items that are particularly rich in potassium include banana, orange, avocado, tomato, spinach, pumpkin, potato, mushroom, oyster mushroom, seaweed, oat, millets, dairy products, beans and bean products.

### Box 1: Healthy Eating Food Pyramid in Hong Kong (for Adults)





## Healthy Lifestyle for Optimal Blood Pressure

Apart from healthy eating, members of the public should also avoid smoking, refrain from alcohol drinking, be physically active as well as maintain an optimal body weight and waist circumference. DH will continue to step up efforts in enhancing public awareness about the importance of healthy living in preventing hypertension and work in close partnership with other government bureaux/departments as well as community partners to build a health-enhancing environment.

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## World Hypertension Day

World Hypertension Day is observed every May 17th in order to raise awareness and promote hypertension prevention, detection and control. For more information about the campaign, please visit <https://ish-world.com>.

Hypertension seldom causes symptoms until complications develop. Most people therefore are unaware they have such 'silence' disease. Having regular blood pressure checks allow early detection of hypertension. The Hong Kong Reference Framework for Hypertension Care for Adults in Primary Care Settings (which is accessible at [www.fhb.gov.hk/pho/main/frameworks.html?lang=0](http://www.fhb.gov.hk/pho/main/frameworks.html?lang=0)) recommends adults aged 18 or above to have regular blood pressure checked for early detection and treatment according to the blood pressure categories as shown in the Table below. For details, please refer to the aforesaid document.

Blood pressure categories	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)	Recommendations
Optimal	lower than 120	lower than 80	Recheck in 2 years (once a year for people aged over 75)
Normal	120 to 129	80 to 84	Recheck in 1 year
High normal	130 to 139	85 to 89	Recheck in 6 months
Hypertension	higher than or equal to 140	higher than or equal to 90	Consult family doctor as soon as possible for advice

Source: Hong Kong Reference Framework for Hypertension Care for Adults in Primary Care Settings, Revised Edition 2022.

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